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WRIGHT BROTHERS - CHARLES F. KETTERING

ORAL HISTORY PROJECT

UNIVERSITY OF DAYTON

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ZERBIE BRADFORD

Interviewed by

Susan Bennet

in

March

SB Mr. Bradford, when, when do you first remember?

(break in tape)

ZB The early incidence of the Wright Brothers, was in either 1905 or 1907 when the meeting was held, or a festival was held, at the Dayton Fairgrounds. And Lincoln Beachey flew one of the very early Wright planes with a gnome engine. And that was only a very few weeks before Lincoln Beachey crashed into San Francisco Bay and was killed. The Wright Brothers were, I mean I'll correct that, they, Wilbur died in the early years but...

SB I'm afraid we might get some of that noise there, from you doing that.

ZB Yes. Orville was an individual who was a very brilliant man, and was very interesting to talk to. He would sit and talk to an individual but not to a group. He never made any public speeches or I never saw him talking to a group of people.

SB Do you remember where you first met him?

ZB At the Engineers Club here in Dayton.

SB Yes, that was...

ZB He'd come to the meetings at the Engineers Club in the comparatively early days of the club.

SB Would he ever go up to anybody and introduce himself or did they...

ZB Oh, no, no he was a very, very, very shy person.

SB You had to go up and introduce yourself to him, is that right?

ZB Yes, and he was not very formal about the introducing end either. If you had some questions or wished to talk to him, he was a very interesting

person.

SB Well, when you say he was interesting, you mean in just the topics that he was interested in?

ZB Well, yes, but he was very broadly, very broad views of everything that was going on I would say.

SB Like, you mean like in national things?

ZB Yes, yes, yes.

SB How did he feel on politics?

ZB Well, I never discussed. We, our discussions or our talk was mostly on aircraft and related subjects. We didn't wander out into other fields.

SB Did he ever express himself on the government and their reticence about developing the plane?

ZB No, no I never heard him say anything about that. He was very cautious I think at all times on what he would say, and any remarks that he would make, and that would be...

SB About what time was this, year?

ZB Oh, this was, we'll say after World War I.

SB After World War I?

ZB Yes.

SB He was still interested in flight?

ZB Yes, yes. You see, he made certain suggestions on the aerodynamics and the control of this original buzz bomb which is in the Wright Patterson Museum. He told them how they would have to design this to make it stable in the air when there was nobody there to control it. This was an airplane that would fly automatically.

SB The guided missile.

ZB Yes.

SB The guided missile.

ZB And it had a fifteen degree dihedral and first they built it without it. And then he told them to make it this way or it wouldn't be stable, and I remember that they made it this way and it was stable.

SB Then he wasn't in on the original design or was he, or...?

ZB He might in some way. But I was not around at the time of the first work on the plane itself. Now do you want to shut that off a minute, I'll tell you more about that, tell you why.

SB Okay.

(break in tape)

SB Okay, we're talking about the Kettering Bug and its method of control.

ZB The head of the A. William Piano Company from New York was here for a long time helping in the design of the control which consisted of bellows similar to those used in the player piano. The bellows would be connected to the intake manifold of the engine which produced a vacuum, and the valves would be open and closed to control the height and the direction of this little plane. The gyroscope controled the direction and actuated the valves, and the anemometer controled the vertical height so that the plane would fly at a fixed height. Mr. Spade spent considerable time advising on the gyro control. I think that the man from the piano company was Mr. Estee, I'm not sure of that name. All right, do you want to?

SB Oh, well let's, let's just leave it on, if we keep going back and forth I'm afraid we won't get any.....

ZB Oh, I see.

SB You said, when you'd see Mr. Wright at the Engineers Club, did he ever come with any one, do you remember?

ZB I never really knew him to come, no, no, no. You see, Mr. Wright had a special automobile that he owned. He could not stand to ride in an ordinary

car in the early days. You see, this accident that they had in France injured his spine, and he had first a Pierce Arrow with very special shock absorbers to give a smooth ride and then later he used a Franklin car, but he said he couldn't ride in an ordinary car, it would be very painful to his spine. He did not fly for that same reason, that he was afraid of any bump in landing or anything like that. That must have been very severe. Apparently it probably would put the spine, displace the joint on the spine.

SB Did he ever express any regret about not being able to fly?

ZB No, no. He was one of these persons that never complained about anything that I ever heard.

SB Is that so?

ZB Very discreet in all his statements, yes. Very, very much so.

SB Did you ever see him anywhere socially, after, except at the Engineers Club?

ZB That's all, that's all.

SB I wondered was there any talk of any interest that he had other than the plane?

ZB Well, no. I do know that he visited Mr. Kettering and Mr. Deeds, and they no doubt discussed many things pertaining to aviation which was his chief interest.

SB Did he have any civic projects that he worked on in the city?

ZB I don't think so. He just didn't get out and mix with people. He was very reserved, and I would say kept very much to himself.

SB Do you remember if he ever expressed an idea of the planes being used for war or the moral aspects of this bomb?

ZB I never heard him express that, but as I understand, he was not happy that they were put to that use. But you see, in the early days, when we got into World War I, the airplane was a part of that war. And the other thing was that

when they went to France in the early days to sell the idea of an airplane, the only people that were interested was the army. And then when they come back to this country the only people that were interested here was not even the army. They had to go to the Signal Corps; the army would have nothing to do with aviation. It was the Signal Corps who took over all problems and all purchases and everything pertaining to aviation. The Army and the Navy, in the early days, had no interest in aviation.

SB Did people in Dayton think, think they were pretty strange?

ZB No, I think they understood them. They were people that lived pretty much to themselves. You see in the early days, they no doubt had some very unhappy experiences with the legal entanglements that come about in the early days of the airplane. With Glenn Curtiss and some other folks where they got into legal entanglements.

SB And you think that entanglement sort of soured him on mingling with people.

ZB I think that to some extent, yes. I believe they had a very hard time there in the early days, in getting this legal entanglement straightened out. I guess no accurate history has ever been made of that has it? From...

SB Well...

ZB Of course you have court records, and things of that.

SB Yes, court records and their papers; I think in time, it was an emotional issue for so long that it's difficult sometimes; it takes time to work those things out.

ZB Yes.

SB Do you remember if he ever went to church?

ZB No, I have no idea. I have no idea about that. You see, his father was a preacher.

SB Yes, I know they were.

ZB A UB preacher.

SB And, I can't, in talking with people I've asked this question, and no one seems to remember whether or not they ever did attend church.

ZB You know, I think that one thing that influenced those two men was that as they became known throughout the world, they didn't go out amongst people because I think probably people would stop them and ask them questions which they didn't want to get into answering, things like that, and they stayed very much away from the public. Now, this very early celebration that they had at the fairground, was a celebration in honor of them coming back from France, and having demonstrated a practical airplane in France. They asked them to make a speech out there at the fairgrounds and they both declined. They didn't hear a word out of them. And they...

SB Did you go to the celebration do you remember?

ZB Yes, I stood out there at the fairgrounds watching this thing.

SB About how big the crowd was there? Do you remember?

ZB Oh, I would say the fairground was full of people probably fifteen, twenty thousand people out there, because the first time anybody had ever seen anybody do any acrobatics, and this fellow Lincoln Beachey was really an acrobat in the plane.

SB Well, with the plane, oh he flew the plane over the fairgrounds?

ZB Oh, he not only that, but he looped the loop and barrel rolled and he was very, very accurate in his maneuvers, and he was just commonly known as a daredevil flyer. Now all those early pilots especially, very few of them that survived flying these old wooden planes. They met with an accident someplace or other. Lincoln Beachey pulled the wings off of his out over San Francisco Bay and went right down.

SB He was a daredevil.

ZB Captain Steele out here at the air show some years later did the same thing, I saw that. He dove down there and the wings folded back.

SB Was that 1924 when they had the show?

ZB 1924, and they found him fifteen feet down in the mud out there, in the swamp out there at Patterson Field.

SB You wonder how anybody would go up after all that.

ZB Now, have you gotten also the history of the naming of Patterson Field out here?

SB Yes.

ZB Well, good.

SB When you saw them out at the show, did you notice any particular difference between the brothers?

ZB Well, I was way, way away, I didn't even get near them. I was away back. Yes.

SB Or did you remember of Orville ever speaking of his brother?

ZB No, I don't. Oh, I think in conversation, yes. He would bring up things that he did and said, but Wilbur died, I don't know what year, but it was rather early.

SB 1912. Yes, it was very, very early.

ZB I didn't remember what year.

SB You never did tell me how you came to be working on the Bug?

ZB Alright. I had charge of the drafting room at Delco at the time, Jim Wright, John Wright and Ed Burdough, who worked in the drafting room; were asked to work down on Ludlow Street and they did the designing, made the drawings of the Bug and a lot of things that went with it. I designed the generator that went on the front end, or the rear of the engine which was known as an Alexanderson generator, it was a DC generator with a commutator, and coils wound in slots in the pole pieces which gave a high frequency to

run the gyro and this gyro controlled the direction of the plane and run at fourteen thousand RPM. Now Delco made the distributor, the generator, ignition coil and so forth for this little bug. That's the only part that I had in there, the designing of the generator that went on this little bug. And I think they have one of those out here at the museum.

SB Yes, yes they do. Did you feel a sense of importance that this thing was very secret or was it just another job?

ZB Well, here's the thing; even in World War I the whole thing was every civilian thing was cancelled out. We were on war work. There was a secrecy and caution on everything because, at that time, we were the sole supplier of ignition and generators for all the eight cylinder engines, V-engines in the world, both France and American. So there was unusual safety precautions taken, plant protection and in every way. I think more so than in World War II.

SB Is that so?

ZB Yes.

SB Was there a good reason for it?

ZB Yes, all they'd have to do was if somebody had dropped a bomb under a Bakelite accumulator over there we wouldn't have made any more ignitions for months.

SB Oh.

ZB So, I'll always remember that they put a steel screen around and put a watchman at this place twenty-four hours a day.

SB Is that so?

ZB Of course we were highly criticized, you see, because we had a monopoly.

SB Oh, that's with General Motors, you're speaking of?

ZB With Delco.

SB Were they part of General Motors at that time?

ZB They were a part of General Motors, but it didn't feel as they do now, that they weren't as tightly controled in things of that sort. But, you see, we had the electrical equipment developed for the eight and twelve cylinder engines because we had it on Cadillac, Packard, we had it on the racing cars, over at Indianapolis. Now did Jim Wright tell you who made this engine for the little bug?

SB No.

ZB Where it was made?

SB No.

ZB Well, Ralph De Palma was a racing car driver in Detroit. He had a little shop up there. The engine for the little Bug was designed and built in Ralph De Palma's shop. So Harry Golden from Buick designed the engine, C. Harold Wills who had been with Ford, supervised and, I think to some extent, financed this engine development up there in Detroit. Those engines were made in Detroit, see; they never made very many of them. Maybe probably ten and shipped down here, because the war was over before this thing ever got used. But that is a thing that I think should be carried along.

SB It seems like the progress of the gasoline engine from the time of that first Wright plane, up to the time of World War I was amazing.

ZB Yes, it was. Airplane engines, the French of course did a typically French thing. They made absolutely impractical engines. In other words, they had a propeller here mounted on a stub shaft and they had five cylinders here and these cylinders rotated. That's what Lincoln Beachey flew out here, these things going with five cylinders rotating around in the air. Everything whirling and they attached the propeller then onto the cylinders that were rotating, instead of having an engine and the crankshaft rotating; they, the crazy Frenchmen, had reversed this thing. And it wasn't practical. It didn't ever last very long, but that, that was their version.

SB Well, now, did they put that on a Wright plane, the rear engine?

ZB Yes, yes. Now this. There was Gnome, and Rhone, R-h-o-n-e. They were both rotary cylinder engines, with the cylinders rotating.

SB Now, they didn't last very long though did they?

ZB No, no, they went out. But of course those things were used to some extent in World War I. The other early aviation engine that was practical of course was Hispano-Suiza. That was a designed in Switzerland, between Switzerland and France, and Hispano was a practical engine. We were building ignition and shipping it over to France during World War I for them.

SB Did Mr. Wright have anything to do with the engines, or was it just the aerodynamics?

ZB He didn't, you see, in the very early days, there wasn't any such thing as an airplane engine. They built a few out here, for these old wooden planes, but they went out of business awful soon on there. Glenn Curtiss made an eight cylinder V engine for airplanes. Now the Wright Company was sold, that is the Wright brothers sold their company to the, let's see, I think that was Curtiss-Wright down east.

SB Well, now they sold it east, but it was not, it was not Curtiss-Wright at that time.

ZB Wright Aeronautical?

SB Well, it was a corporation actually, in 19... they sold the patents and then they were part of the company and then finally Orville sold out the whole works in 1915. But they were still fighting over the patent rights at that time.

ZB They, you see the radial engine then, Charlie Lawrance designed and built the first, it was a three cylinder radial engine, now these cylinders didn't rotate they stood still. Charlie Lawrance's wife, and sister...

SB And not Charlie Taylor?

ZB No, Charlie Lawrance's wife and sister, E.H. Harriman.

SB Oh, is that so?

ZB That's the reason Charlie Lawrance had money enough to build an aviation engine.

SB Now, I, I don't know that name at all. Who was he?

ZB Charlie Lawrance? He was with the Wright Corporation down east and they later went, those two companies, the Curtiss-Wright, Curtiss got in some way with this company down here. And Charlie Lawrance and one of the, from Hamilton, here, Rentzler, and I can't think of the, the chief engineer's name down there in Wright, Haas? They broke away from this Wright Aeronautical, went to Hartford and started working for ^{Pratt & Whitney} Ralph Mortinger aircraft. And Charlie Lawrance was with or built this just before they started and I think he helped them get started on a nine cylinder big aviation engine, radial engine. But Charlie Lawrance was a pioneer and a very, very early man on aircraft engine design. Are you going into the, the history of aircraft engines?

SB No, no not really, I'm supposed to just find out as much as I can about Mr. Wright.

ZB Yes.

SB But in studying, I mean in talking about Mr. Wright and going out and see the planes, I just sort of got fascinated with the ingenuity of the men who worked on them and how it seemed like they just started with nothing, and developed not only the planes, but the engines, and the aerodynamics of the whole thing.

ZB Well, you see we didn't have any highly educated people then.

SB You just had to work it out? I wondered somehow, I have often wondered if all the highly educated people now-a-days could have done, could do as well?

ZB All you got to do is to work.

SB To work.

(break in tape)

SB Now, we're going. Oh, I wondered what, what did he wear when he would show up out there?

ZB Who?

SB Mr. Wright.

ZB Oh, at the South Field when they was building this little Bug, I...

(break in tape)

(end of side one)

(start of side two)

SB Now we're going, oh, I wondered, what did he wear When he would show up out there?

ZB Who?

SB Mr. Wright.

ZB Oh, I, at the South Field when they was building this little Bug, I was never out there.

SB Oh, I see.

ZB I only went down on Ludlow Street where they were doing the mechanical work on the engine controls and so forth.

SB Did he come down there?

ZB No, no I don't think he was ever coming down there. But Mr. Wright was always a very plain dresser. Nothing gaudy. But you could always tell his automobile around town because he had these very special shock absorbers on it. The only car like that around the city.

SB When you'd see him down-town, would there be people with him, anybody with him, did he have any close friends?

ZB Never, no. I don't think so. I don't think so. His sister lived with him out there until rather late years. She got married. But he just didn't socialize with a lot of people.

SB Did people think of him as a rich man in those years?

ZB No, I don't think so. He made no pretense and the settlements that they got out of his litigations, I think he conserved that very well. And there was never any pretense of being a wealthy man.

SB Did you ever see him at any functions having to do with aeronautics here?

ZB Only at the Engineers Club.

SB That seems to have been his only social outlet.

ZB Yes, yes. I think so. Because you see in the early days, over here at the Engineers Club, they had some of the most distinguished people in the country that would come there as speakers.

SB How did they get them?

ZB Well...

SB To come?

ZB I think they got those people mostly through the fact that Mr. Kettering knew a lot of these people, personally knew most of these people. In the early days at the Engineers' Club there you see they had Dr. Steinmetz, Dr. Coolidge, and other people who were very...

SB This one side I got up too high it seemed like we were getting a lot of noise. I guess it's okay. I'm sorry, I didn't mean to interrupt you.

ZB No.

SB I think it's okay.

ZB Now why should that...

SB Make that much noise? I don't know.

ZB Now is there anything else that?

SB Oh, we were talking about the Engineers Club.

ZB Yes.

SB ...because Mr. Kettering organized it you thought, or helped organize it.

ZB And he knew these people or had had personal contact with them, and in that

way they were able to get them to come here and talk. It would be very difficult today to get some people of the equivalent status.

SB How often did the Engineers Club meet?

ZB They had a meeting, technical meeting, every month.

SB Every month and Mr. Wright would always show up for that.

ZB No, not always. No, no. Only on some very special occasions. I think possibly where it pertained to aviation. As I don't remember seeing him at any of the other meetings where maybe somebody on electrical subjects were here.

SB Did he enter into any of the government of the club, officers or things like that?

ZB No, no, he never held any official position down there. Unless it might have been in the very early days, now I can't verify, I can't remember this. He may have acted as a trustee, in the very early days, but I'm not sure of that. Now, you see, the Engineers Club was built and largely maintained for a good many years, after it started by Mr. Kettering and Mr. Deeds, it was not on its own until sometime after it was organized. Then they had to make their own way.

SB It was just organized people interested in mechanics?

ZB Yes, and they, you see, the dues were very low and it was not self-supporting and then when the time come that it had to be self-supporting they had to increase the dues and get more money in return.

SB Well, they just asked pople whom they wanted to I guess at that stage in the game.

ZB Well, the membership stayed together all through the years. I don't remember of anybody dropping out even when they raised the dues. There was about, I think in the early days, the dues was ten dollars a year.

SB Not that today, I'm sure.

ZB No, no. And that's the way I remember it.

SB Did Mr. Wright drive his own car, or did he have someone drive him?

ZB Oh, no he always drove his own car, as far as I ever say him, yes. But...

SB Did you ever see him with any ladies besides his sister?

ZB No, no I think he was real shy.

(laughter)

SB I wondered how he avoided them, after all.

ZB I don't know.

SB Did he ever write letters to the editor of the newspaper or...?

ZB Oh, I don't think so, no. No, he kept out of publicity very, very religiously and kept in the background. I don't believe that he even wrote any magazine articles, technical articles. Although he had one of the earliest wind tunnels and was in a position to put out technical information. But I don't believe that it appeared in any periodicals.

SB As far as Dayton people were concerned, he must have been sort of like somebody who lives here who nobody notices too much.

ZB I think, I think that describes it. He lived here but I would say that there were very few people that knew him intimately, you know. I just wanted to listen.

SB Okay, should I turn it off?

(break in tape)

(end of tape)

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